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### **Abstract**

This thesis introduces spatial design guidelines for Aalto University Learning Center that could also be used as a platform for upgrading the existing facilities of the University. The work was driven by a vision of an ideal learning environment – a space that always meets the needs of its occupants and embraces constant transformation as an essential part of its nature.

The concept of an “Ever-changing Space” was developed through observation, experimentation, and reflection. First, the background of a Learning Center initiative was revised to define the scope of the project. Second, change, openness, community and human senses were brought into focus and studied through the prism of architecture. Third, October through December 2011 the concept was prototyped at Aalto University Library, Töölö, as Aalto Hub Töölö project. Fourth, all acquired data was re-evaluated to define spatial design guidelines for Aalto University Learning Center.

“Ever-changing Space” encourages pro-active user participation that ensures continuous natural development of the space and fosters the sense of community and ownership. It recommends providing tools for the occupants to quickly and independently modify the space as their needs change. Involving all senses is suggested as a technique to achieve fuller engagement of the people in the space.

The project found a lot of supporters already during the prototyping phase. The statistics of Aalto University Library, Töölö, has shown increase in number of visitors by 12.2% in October, by 16.6% November and 14.8% in December 2011 compared to the same period previous year. As this thesis was being written, plans were made to launch a similar space in Aalto University Otaniemi campus.

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**Keywords** spatial design, learning environment, learning center, Aalto University

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# EVER-CHANGING SPACE

Valeria Gryada



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Spatial Design Guidelines for Aalto University Learning Center

Valeria Gryada

Master Thesis in Spatial Design  
School of Arts, Design and Architecture  
Aalto University

2012



# ABSTRACT

Aalto University School of Arts, Design and Architecture

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# FOREWORD

I first came to Finland and this school in 2008. During my study years I've been fortunate to take classes from different Aalto University schools ranging from my major in spatial design to ceramics production, to city planning for Amman (Jordan), to international design business management. I've also met a great number of amazing people who challenged and inspired me. Writing this thesis, too, largely contributed to the changes in my understanding of what it means to be a designer.

The turning point – and the most difficult thing to do – was shifting from a purely result- to a process-oriented design. With that came the comprehension that a space is never finalized, never completed. To me, a space is always a process, a condition. A well designed space is always alive.

The learning experience of the past years also taught me to forgive people for “mishandling” design and allow them to be its co-creators. Now, my biggest joy is to see spaces modified, customized, and thus, inhabited. I've also learned to actively involve users with design from an early stage on to ensure they feel attached to the final outcome. I believe that those spaces are truly beautiful where people feel at home. As a designer, I wish to create positive change and encourage people through my work.

After all, I am grateful to Aalto University and my teachers for the opportunities and knowledge that they offered me and proud to be joining this school's alumni.



# CONTENTS

Abstract. . . . .	5
Acknowledgements . . . . .	7
Foreword . . . . .	9
Introduction . . . . .	13
Learning Centers . . . . .	13
Aalto University Learning Center . . . . .	14
Observation . . . . .	17
Change . . . . .	18
Openness . . . . .	23
Senses . . . . .	29
Findings. . . . .	37
Experimentation . . . . .	39
Place . . . . .	40
Design . . . . .	44
Reception . . . . .	54
Findings. . . . .	59
Reflection. . . . .	61
Ever-Changing Space . . . . .	61
Concept Application . . . . .	67
Conclusion . . . . .	69
List of References . . . . .	71
List of Figures. . . . .	75



# INTRODUCTION

## LEARNING CENTERS

The term “learning environment” suggests both place and space. Indeed, much learning takes place in such “traditional” settings as schools, classrooms, and libraries. However, it is more and more common for learning to happen in less conventional spaces – cafes, hallways, and on-the-go. Moreover, today’s information- and technology-driven world offers variety of services for virtual, online and remote learning. Thus, learning environments cannot anymore be only seen places, but as “the support systems that organize the condition in which humans learn best – systems that accommodate the unique learning needs of every learner and support the positive human relationships needed for effective learning. Learning environments are the structures, tools, and communities that inspire students and educators to attain the knowledge and skills” (Partnership for 21st Century Skills 2009:3).

University is one of the most traditional forms of a learning environment. Yet, nowadays universities find themselves in the middle of a fascinating process that is changing the landscape of higher education and research. There are several trends in the field that are worth mentioning. First, there is a decrease in the size and increase in mobility of younger generations in the Western World. When it comes to studying, young people can freely choose where to go. Universities now compete on not only national level but internationally. This takes emphasis from quantity to quality and increases the

importance of ranking lists. Second, a trend of life-long learning is developing in higher education. Alumni often return to universities to sharpen their skills or contribute as external teachers and research collaborators. Third, changes occur inside industry. Big enterprises shift from internal research laboratories that have served them for years creating new innovation to outsourcing. More open innovation process allows companies to cut their running costs and make innovation happen faster. It also means active collaboration between large enterprises and other companies, small start-ups, and universities (Aalto University Campus Discussion 2011:5).

Universities have always been international. However, the above discussed trends have proved international visibility to be even more significant. Consequently, a need arose for new tools to improve university’s presence on the international arena. Creating a learning center came to be one answer to that demand. Located around the world, major examples of learning centers – Seattle Central Library, Sendai Mediatheque, and Rolex Learning Center in Lausanne – have many similarities. They are all designed by internationally renowned architects to redefine such traditional learning environments as libraries, combine them with high-edge technology and facilitate social interaction in the premises. The results may vary, but one thing remains unquestionable: those learning centers are highly recognized all over the world.

## AALTO UNIVERSITY LEARNING CENTER

Learning Center is mentioned in Aalto University Strategy as one of its development targets. It is seen as a bustling space where researchers, scientists, students, companies, political and other influencers and the general public can meet and interact, be it for research, art or educational purposes (Aalto-yliopiston Strategia 2011:11).

The subject is further defined in Aalto University Campus Discussion white paper. According to it, the future learning center is to respond to the current change of the universities' role in society and address the need of enterprises, communities, alumni, current and future students for a stronger interaction with Aalto University, and provide a natural setting for collaboration and discovery. That is to be practically achieved by offering facilities for professional and complementary education, diverse information and library services, exhibitions and conferences (Aalto University Campus Discussion 2011).

The author first encountered the theme of a learning space while working on an industry project within Aalto University's interdisciplinary International Design Business Management (IDBM) course in 2010-2011. On request of Aalto University Corporate Relations, a theme of

Aalto University Learning Center was investigated to create a concept for one. Six months of research and ideation later was produced a report that for the first time brought to life the idea of Aalto Hub that further led to this thesis.

### Spatial Design Guidelines

While working on the IDBM project the author noticed that the learning center was almost always discussed as a set of functions. The desired environment was described in such adjectives as "welcoming", "open" and "creative". However, there was little explanation of how those spatial qualities could be achieved. The produced project report, too, concentrated on the learning center services. As for the few provided design recommendations, they appeared to be too concrete talking about preferred size of windows and types of furniture.

The author felt that there was a need to define more general guidelines that would help to design any and every space of Aalto University Learning Center. The guidelines would have to be generic enough to be applied to any possible location and size of the place. The goal was to create a solid spatial design platform for the future planning activities.

At the same time, the author had a strong vision of an ideal learning environment. This was a

place that stimulated imagination, supported community and instantly responded to the changing needs of its occupants. However, it was unclear how to translate those values into physical space of the learning center. This thesis was largely written to find an answer to that question.

## Methodology

First, to understand the scope of the project it was decided to take look at two documents that define a concept of Aalto University Learning Center – IDBM Learning Center project report (Aalto Hub Magazine 2011) and Aalto University Campus Discussion white paper (Aalto University Campus Discussion 2011). The two papers were studied and compared to outline common trends and requirements for Aalto University Learning Center space.

Second, a research on similar spaces was conducted to recognize the contemporary developments in the field. The study focused on such aspects as spatial programming, managing change and openness in architecture, and human senses.

Third, a prototype space was created based on both Aalto Hub concept (Aalto Hub Magazine 2011) and the author's research – Aalto Hub Töölö. The process was documented and analyzed along with the impact of the prototype space.

The gathered knowledge was combined to that from the preceding research.

Fourth, spatial design guidelines for Aalto University Learning Center were created based on the three previous steps.

## Limitations

This thesis assumes that there is demand for a learning center as it is described in IDBM Learning Center project report and Aalto University Campus Discussion white paper and bases inferences on the content of those two papers.

If built, Aalto University Learning Center would probably be located either in Aalto University's Otaniemi campus or in downtown Helsinki. However, this thesis does not look into possible location of the learning center and aspect directly connected to it. Architecture of the learning center building is not discussed either. Technical solutions are left outside the scope of this thesis as well.

This thesis offers a framework for the future planning activities for Aalto University Learning Center but does not provide any specific design suggestions. Exemplar applications of the proposed spatial design guidelines are not presented. The author hopes to investigate those in her further work.





# OBSERVATION

The most natural way to begin working on a new task is observation. Asking questions about a phenomenon helps collect facts and lay platform for the further process. This chapter will ask and answer questions about learning center spatial program, the qualities that it calls for and their relation to the way the space is experienced. The best examples in the field will be looked at and critically evaluated.

## PROGRAM

In order to define the spatial design guidelines for Aalto University Learning Center one first needs to understand what Aalto University Learning Center is. The following section will open that up based on Aalto University Campus Discussion white paper (Aalto University Campus Discussion 2011) and IDBM Aalto Learning University Center project report (Aalto Hub Magazine 2011).

First of all, one must mention that these two papers have much in common. However, while IDBM project report only talks about the learning center as a single place, the Campus Discussion white paper suggests a system comprised of a central learning center hub, similar recognizable learning centers (“satellites”) in each Aalto University building, a downtown learning center and Aalto wagon

or carriage in metro. Both concepts call for participatory student-centered design, flexibility and continuous development.

Aalto University Learning Center is meant to bring together researchers, scientists, students, companies, political and other influencers and the general public to meet and interact for research, art or educational purposes. It should also provide a natural setting for collaboration and discovery. Both papers wish for a bustling space where interaction between strangers is encouraged, and the atmosphere is warm, open and appreciative.

According to both papers, Aalto University Learning Center should have a very strong identity recognizable both within and outside the university. That can be accomplished by creating a space that is intrinsically “special”. With this in mind, the virtual aspect of the space is considered important by both research groups. IDBM project report then suggests combining very high-tech and low-tech elements for a stronger impact. Different behavioral rules in spaces used for different purposes are to be encouraged by facilitators, who will also help collecting constant user feedback (along with other feedback tools) and ensure reacting to it. Both reports agree that it is vital that each and every element of the learning center can be touched and tested.

In addition, natural elements (natural materials and vegetation) are considered an important factor for occupants' wellbeing in the space along with possibility to go outdoors. IDBM report states that all five senses – hearing, sight, touch, smell, and taste – are to be used in the space to create ambiance and spread information.

As for the possible functions of the space, facilities for professional and complementary education, access to information and library services, exhibitions, conferences and other events (both large- and small-scale), spaces for meeting and interacting with other people, working, learning, eating and drinking, are listed as potentially interesting.

The IDBM project report emphasizes that empowering constant natural change should be the driving force for Aalto University Learning Center development. However, it is this “change” that becomes an issue when formulating spatial program. The place is neither a library, nor a classroom, nor a common room. As a matter of fact, it is all of these and more. The list of potential functions is constantly changing, and more alteration is yet to come adding new functions and excluding those that are no longer relevant. Thus, perhaps the most fundamental rule is to design for flexibility and embrace change instead of fighting it.

## CHANGE

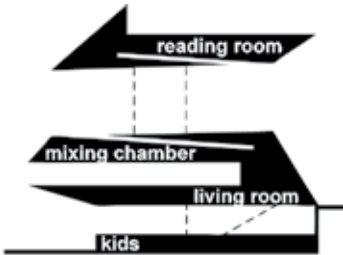
As we have seen, change is an integral part of Aalto University Learning Center concept. The question then is how to embed it in design.

Seattle Public Library and Sendai Mediatheque are two prominent examples of addressing this issue. In his study on the relation of the relation between institution, organization and space that compared these two projects Henric Benesch concluded that they “display explicitly different attitudes towards design, organization and the future unknown” (Benesch 2007). Spatial design is where these attitudes are manifested.

### Seattle Public Library

Designed by OMA, Seattle Public Library opened its doors in May 2004 and quickly became an important reference point in contemporary architecture.

OMA state that their “ambition is to redefine the library as an institution no longer exclusively dedicated to the book, but as an information store, where all potent forms of media – new and old – are presented equally and legibly” (OMA/Kolhaas 2007: 66). They point out that “flexibility in contemporary libraries is conceived as the creation of generic floors on which almost any activity can happen”. “Programs are not separated, rooms or individual spaces not given



unique characters. In practice, this means that the bookcases define generous (though non-descript) reading areas on opening day, but [...] inevitably come to encroach on the public space. Ultimately, in this form of flexibility, the library strangles [its own] attractions” (OMA/Kolhaas 2007: 66).

Instead of “ambiguous flexibility” (OMA/Kolhaas 2007: 66) OMA offered an approach that included reformulation of the spatial program. The library presented itself a variety of programs and media that OMA consolidated combining like with like. Thereby were identified programmatic clusters: five of stability (Parking, Staff, Meeting, Spiral and Headquarters) and four of instability (Kids, Living Room, Mixing Chamber and Reading Room). The five were defined as “platforms”, equipped for maximum, dedicated performance and shuffled in relation to the four defines as “spaces” (see Figure 3 on page 19), “trading floors where librarians inform and stimulate, where the interface between the different platforms is organized – spaces for work, interaction and play” (OMA/Kolhaas 2007: 72).

It is argued that OMA updates the library as institution and as organization by spatial means (Benesh 2007). “Their design adjusts and tunes the organization to the present and to the hopefully future conditions [and] empowers the organization to do what they always have been doing but in a more appropriate and informed way according to current demands

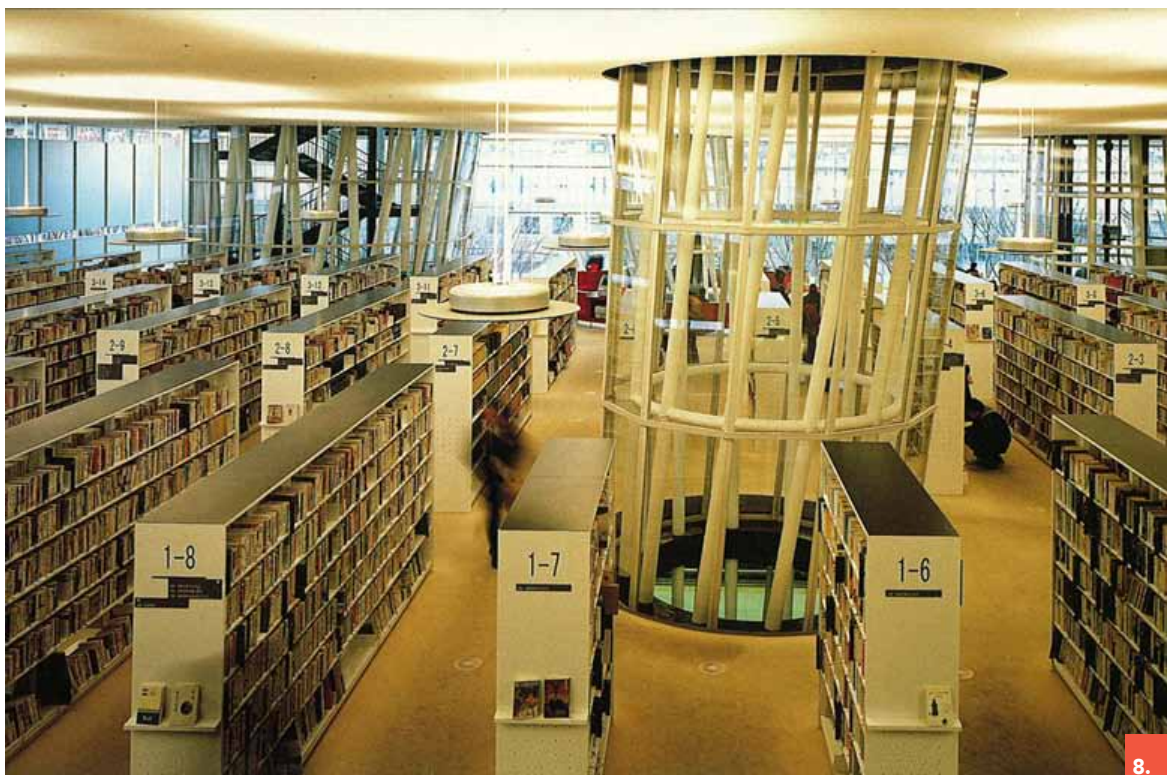
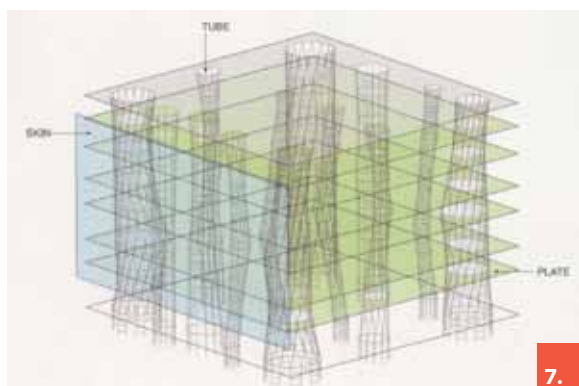
and expectations. As such it suits well in a planning tradition where everything more or less can be planned, [...] where the future can be reasonably contained and delimited. [...] This is a tradition where the future is not allowed to come as surprise and as such future novelties and inventions are sacrificed on behalf of continuity and order. In this sense OMA and most of their design proposals are less revolutionary than we might think, leaving little space for the future unimaginable” (Benesh 2007).

### Sendai Mediatheque

However, there is an alternative approach to dealing with future through architecture.

Completed in 2001, architect Toyo Ito’s Sendai Mediatheque, Japan, is a multipurpose cultural center and indeed one of the most significant modern day architectural landmarks. It is celebrated for both visual elegance and radical structural solution. As Toyo Ito puts it himself in a statement published by Designboom online magazine, “Sendai Mediatheque embodies our proposal for a completely new concept of architecture. [...] The complex includes a Mediatheque, an art gallery, a library, an information service center for people with visual and hearing impairments and a visual image media center. During the open competition and subsequent phase of basic designing, our primary effort was on demolishing the archetypal ideas





of an art museum or library to reconstruct a new idea of architecture called 'mediatheque' utilizing the state-of-the-art media" (Ito).

The project was based on Ito's concept of "blurring" – crossing of temporal and spatial thresholds – that originated from the touring exhibition "Blurring Architecture" which ran during 1999 and 2000 in Aachen and Tokyo and later on in Antwerpen and Copenhagen, Louisiana (Benesh 2007). Toyo Ito's approach was to not to apply a specific form of building to a specific form of program but rather to build "...architectural hardware [...] flexible enough to respond to any new future development." (Ito 2009:46). The design was handled as a floating space with no particularized forms made out of three independent architectural elements: "plates" (floors), "tubes" (columns) and "skins" (façades) (see Figure 7 on page 21) (Ito 2009).

A proposed vision stated that designating spaces to isolated functions would limit free action. Instead, the building design sought to allow users to discover new spaces and new uses for themselves. The space and use in Sendai Mediatheque is generated by furniture. Large-scale structures have a wall-like effect, stabilizing the use, setting limits and directions while offering possibilities to tune in with present conditions and to try things out. Sets of commonly sized furniture are used to direct the use of space, both by

the staff and the visitors. "In opposition to conditions where dedicated spaces or "rooms" defines use; the use and dedication of space is set by the way it is furnished. In this way some of operative initiative is distributed from management, directors, designers and architects down to staff and guests, thus opening up for that which could [not be] imagined, planned for or foreseen" (Benesh 2007).

It is believed that Sendai Mediatheque is open to the future as something which not only is about improving or calibrating but actually changing (Benesh 2007). This strategy demands constant activity and reflection, assuring consistency and continuity through staff and visitors and their future commitment only. This is a much more demanding model. Yet, it also offers much more potential for successfully embracing the change inevitable.

...

Both studied projects recognize change as a factor strongly influencing spatial programming. As shown above, there are two design approaches that can be adapted by Aalto University Learning Center. The first one demands working within a well-defined spatial program that manages future as one of its variables. The second one calls for abolishing programming altogether in favor of maximum flexibility.

It has been noted that change is an essential part of the project so it may seem obvious that the learning center should follow the footsteps of Sendai Mediatheque. However, the answer may be less straightforward. Perhaps, it is spatial “blurring” that OMA criticizes as “ambiguous flexibility”. At the same time, Ito’s theory that defining spaces by isolated functions limits free action appears to be a valid counter-argument to that. On the one hand, it can be reasoned that Seattle Public Library handles the change as something that must be “contained” by organizational and architectural means and thus alienates it. On the other hand, Sendai Mediatheque may put too much faith in its occupants’ collective commitment to constant transformation. All in all, it stays unclear, which path Aalto University Learning Center should take.

Interestingly, when observing the photographs of two spaces one cannot but notice that the projects have one very important feature in common. In both cases furniture is used to define spatial function. Yet, Sendai Mediatheque (see Figure 8 on page 21) emphasizes this phenomenon as a major part of its spatial philosophy while Seattle Library (see Figure 4 on page 19) stresses other design aspects.

Finally, comparing these two approaches raises a question of spatial flexibility. This quality, along with approachability, appears to be one of the most desirable characteristics of Aalto University Learning Center. In turn, flexibility in architecture reminds of such concepts as “open plan”, “open doors” and even “open source”. Possibly, the relation of change and program could be better understood through the prism of spatial openness.

## OPENNESS

It remains a question whether a completely open plan is the most appropriate spatial solution for Aalto University Learning Center. To answer this one should take a look at a case of a similar facility where traditional spatial program is dismissed in favor of maximum flexibility. An example of such place is Rolex Learning Center in Lausanne, the undisputable benchmark for Aalto University’s initiative.

### Rolex Learning Center, Lausanne

Designed by SANAA, Rolex Learning Center opened its doors in 2010. The building brings together a 500,000-volume open-stack library, a 600-seat auditorium, places to study, and



facilities for dining and socializing. It serves as a hub for école Polytechnique Fédérale de Lausanne's, Switzerland (Rolex Learning Center).

According to Architectural Record magazine, "the architects' goal was to create one fluid space where students and researchers from the school's various disciplines can mingle in an environment with almost no traditional partitions". "Instead of using steps, stairs, or walls, SANAA separated different functional areas by placing them in floor valleys or tucked between the five outdoor 'patios' cut within the building's rectangular footprint. These ovoid patios, which are surrounded by glazing, provide a variety of landscaped places and bring daylight into all parts of the one-story facility" (Pearson 2010).

Some visitors argue that the building's greatest strength is "the [magical] experience of meandering through the space" that challenges "traditional notions of movement through man-made constructions as strictly vertical or horizontal" (Pearson 2010). Yet, others debate that this "landscape" experience is a source of shortcomings in accessibility (Minutillo 2010).

Remarkably, one of SANAA leaders, Sejima Kazuyo, previously worked at Toyo Ito's office (Igarashi 2011, under "The Impact of Ito Toyo"). In fact, Rolex Learning Center is a great illustration of an approach similar to Ito's "blurring". Here functions are, too, separated

by unconventional methods. However, the success of those methods and the efficiency of the floor plan are sometimes questionable.

Here is how Josephine Minutillo describes the space: "Tables in both the library and restaurant are raised on terraces and encircled by the same bulky railings that line the ramps. Circular 'cubicles' enclose offices (see Figure 11 on page 25), creating awkward residual spaces between closely positioned cubicles, and between the covered tops of the cubicles and the ceiling. The sloping terrain itself is supposed to act as a divider, but since this is not abundantly clear, some areas are roped off. One large area behind the auditorium is just too steep to serve any purpose at all" (Minutillo 2010). Along those lines, Johann Watzke portrays the Rolex Learning Center interiors as a snow capped terrain of the surrounding Jura mountain chain in his photographic essay "Ski Learning"(see Figure 9 on page 25).

In the author's opinion, despite the indisputable innovativeness of the architectural solution the complex topography of the space almost ignores one notion: the human scale. The spaces of Rolex Learning Center may be called poetic and overwhelming, but can hardly be described as "comfortable". Judging by the available photographs, especially those taken by regular users, the facility does not always cater to the needs of its occupants despite the



fact that Rolex Learning Center was planned as a “living room”, a place where people would want to stay throughout the day. An apparent success in creating international “buzz”, Rolex Learning Center may have done less well in accommodating its immediate users.

### Hub King’s Cross, London

The issue of openness is also dealt with in co-working environments where expectations and preferences of the occupants are very complex. Operating on a smaller scale, these spaces provide a great source of inspiration for designing a learning center that truly meets the needs of its occupants.

One of such places visited by the author is Hub King’s Cross, London. This is the world’s first Social Entrepreneurs Members Club – an innovative workspace solution for a growing international community of social entrepreneurs. It was designed by a London-based strategy and design practice “oo:/”. Borrowing the best from a member’s club, an innovation agency, a serviced office and a think-tank, Hub King’s Cross creates a very different – and very successful – kind of innovation environment. Hub King’s Cross has 450 active members in the United Kingdom and 3 500 members worldwide. It is also a part of a bigger Hub network that connects 30 cities on five continents (Portland Works 2010).

The Hub King’s Cross, like its counterparts around the world, is constructed around a series of basic principles: an open-plan office space and use of physical and social design to encourage certain behaviors such as collection and sharing. The space offers tools that support this way of working. Bespoke furniture allows people to either have an element of privacy or work collectively with others. Writable surfaces enable members to leave notes from workshops in the meeting rooms creating a continuous visible record of how others are thinking and working. Mezzanines and voids let a range of activities to take place at once, whilst maintaining the connection between different parts of the space. The use of the space changes through the day: a breakfast bar in the morning, a flexible hot-desking work space which incorporates a cafe and meeting rooms at daytime, and a venue for lectures, debates and dinners in the evening (Portland Works 2010).

As the space shapes community, community shapes the space. Tatiana Glad, the founder of Amsterdam’s Hub, argues: “Hubs are nothing without their members, who from even before a building has been found, are involved in the collaborative design of the physical and virtual community, and who go on to play a central role in the production of a Hub’s open-source and peer-to-peer programming” (Portland Works 2010: 5). Co-designing lies at the heart of the Hub’s operating



principle. The occupants are encouraged to “leave traces” of their everyday work to personalize the space and promote face to face interaction and connection as people find similarities with other on-going projects. Also, it is the members who contribute to the events’ program of the Hub. Community is naturally formed as people work and play in the same space on a daily basis and further strengthened by the efforts of Hosts who manage the space, support and look after new knowledge networks, and broker relationships between members, ideas, capital and access to skills (Portland Works 2010).

The space well handles the relation between openness and privacy. Only some tables are “assigned” to particular users while most can be occupied by any member on a “first-come, first-served” basis. That creates a constant flow of people in the space. Those in need of more privacy can use the meeting room (see Figure 14 on page 27) that, however, has glass walls, so maintaining privacy does not contradict with a general openness principle.

...

Architectural photographer Jussi Tiainen talks about the increasing number of “examples of architecture that are attention seeking and foreign to their environment, buildings that

are photogenic but alien to people” (Tiainen 2011: 7). In the author’s opinion, that, sadly, may be the case with Rolex Learning Center.

Obviously, this was not the architects’ goal. On the face of things, spatial solutions of Rolex Learning Center are logical. The center is clearly meant to be perceived as a “whole” environment. Generally speaking, the entire building comprises only one space. Its use is mainly guided through furniture, exactly as done in Sendai. Yet, while in Mediatheque the furniture has a very distinct character, at Rolex Learning Center it is almost anonymous and mimics the light grey color of the surroundings. Overall, spatial characteristics are astonishingly even throughout the place. Here, in the author’s opinion, lies the problem of the space. Its uniformity does not allow functions naturally emerge following the environment. In this case openness transforms into a space intended for everything and nothing.

In turn, at Hub King’s Cross openness is combined with surprising spatial variety. The place fully utilizes its potential: every little void has its own function and character. All elements are designed in relation to human scale, something almost completely overlooked at the Rolex Learning Center. Variety and qualities of materials and colors gives the space a warm and welcoming personality.



All that leads to suggest that operating on smaller, human scale will be more rewarding when creating the environment of Aalto University Learning Center. Although it is clear that the issue of programmatic change has to be addressed by a flexible spatial solution, it is occupants' experience that should become design driver.

## SENSES

As spaces are always perceived through senses, it is only natural to consider this during designing. However, while some branches of architecture, for instance, sacred architecture, routinely work with senses through acoustics and the use of light, the "mainstream" seldom considers human feelings as a significant factor. Obviously, there are exceptions to that rule. For example, New York University Department of Philosophy was designed by Steven Holl Architects in collaboration with the Dean of the Faculty of Arts and Sciences and a committee of Philosophy Professors within a concept that organized the new spaces "around light and phenomenal properties of materials" (see Figure 18 on page 31) (Holl).

"Viewing, listening, touching and smelling are each relatively independent ways of positioning your body in an internal representation of the external world. Each sensory system makes its own unique contribution to our awareness of

place and location" (Blesser and Salter 2009:1). The human body truly experiences space when it moves, sees, smells, touches, hears and even tastes within it. "A building is encountered – it is approached, confronted, encountered, related to one's body, moved about, utilized as a condition for other things, etc. [...] We are in constant dialogue and interaction with the environment, to the degree that it is impossible to detach the image of the Self from its spatial and situational existence" (Holl, Pallasmaa, and Perez-Gomez 2006:35). However, the sense architectural designs most commonly rely on is the visual one. It is widely known that vision is the leading sense in humans. Prevailing over the other senses since early times, it only strengthened its position with technological progress and increase in the speed of life. Vision is the only sense that can keep up with the pace of this development. As a result architecture, too, developed into forms that are in the first place meant to be experienced visually.

Aural or auditory sense adds another significant dimension to architecture. Hearing is an important tool that humans use to comprehend space – navigate and shape understanding of forms, objects and distances. Sound design is commonly used in music halls and religious institutions to give space aural personality and spatial texture. Without aural embellishments every space "would sound like every other space of similar size and shape" (Blesser and Salter 2007:52).

Sense of hearing can be used to bond with other people sharing the same environmental experience as aural spaces evoke feelings and emotions. Moreover, powerful spatial experiences can be created by combining aural and visual architecture. This is, in fact, not a new idea. Extensive observations of Paleolithic cave paintings sites in Lascaux, France (see Figure 21 on page 31) suggest a direct relation between the subjects of cave wall pictures and the acoustics of their locations. It is believed that to produce a multisensory experience bison images reflect the strong echoes reminiscent of the hoof beats found in the chambers (Blessner and Salter 2007).

Yet, whenever the use of these two primary senses is limited the whole palette of other senses comes into play, including sensitivity to touch. Experienced through immediate contact, tactile sense is a sense of intimacy, closeness and affection. Human skin can sense sunlight, read texture, weight, density and temperature of matter. Besides, touch is extremely capable of inspiring associations (Holl, Pallasmaa, and Perez-Gomez 2006). This quality has been often used in environmental art. Holocaust memorial in Berlin from Peter Eisenman is an excellent example of a space conveying a very strong message through the qualities of its material, extremely smooth, cold concrete.

The sense of smell or olfaction is potentially one of the strongest spatial design tools. That is due to a strong link between smell and memory. Memories are triggered the moment someone is exposed to a smell. Positive effects of this phenomenon are already utilized in some designs. For instance, aromas that are soothing, anxiety reducing and calming are used in some medical facilities (Augustin 2009:239). Moreover, as memory is intrinsically linked with learning, the olfactory process plays an extremely meaningful role in experiencing a space. Behavior, thought, emotion and intellect can be manipulated by designing for the olfactory sense to create a fuller spatial.

Clearly, it is not very common to literally taste architecture. Nevertheless, the sense of taste can be stimulated by architecture as vision becomes transferred to taste. "Certain colors as well as delicate details evoke oral sensation. A delicately colored polished stone surface is subliminally sensed by the tongue" (Holl, Pallasmaa, and Perez-Gomez 2006:37).

The sense of heat and the absence of heat plays an important role in experiencing spaces. In fact, this particular sense is routinely taken in consideration by construction legislation in most countries. Buildings are "by default" constructed to suit human needs in this area. Air quality is an important factor for occupant's wellbeing





in a space too (Kopec 2006:194). By ensuring that these criteria are met designer provides a solid base for positive space perception.

Such senses as balance and acceleration, kinesthetic sense, and the sense of pain take part in human perception of spaces as well. At the same time, to be utilized to their full potential these senses must be specifically targeted while use of other senses inhibited. A great example of this approach is “the Bridge”, a project shown by Michael Cross in September 2006 in Dilston Grove, south-east London (see Figure 20 on page 31). According to the project website, “the Bridge is a series of steps which rise up out of the water in front of you as you walk from one to the next, and then disappear back underneath behind you as you go, leaving you stranded with only one step visible in front of you, and one behind. The bridge ends in the middle of the water, where you find yourself totally isolated and cut off from the shore. You return the way you came. The mixed feelings of peace, isolation, relaxation and fear that the piece elicits are powerful” (Cross). Still, while providing a fertile ground for environmental art projects, designing for the above mentioned senses can hardly be done habitually.

Another phenomenon that is very strong in humans but cannot be strictly called “sense” is taking pleasure in being close to nature. In fact, connecting with nature is associated

with improvement in health and wellbeing (BMJ-British Medical Journal 2005). There are numerous examples of embedding architecture in natural surroundings. Selgas Cano Architecture Office (see Figure 19 on page 31) is an interesting recent illustration of bringing nature into working environment.

Overall, it is important to realize that embedding senses in design opens an enormous possibility for creating spaces that are experienced fully and engage the occupants in a new, different way. Rich and elaborate spatial impressions can therefore be created by layering designs for all senses.

### The Hospital Club, London

The author visited the Hospital Club in 2010 as a part of background research for IDBM Aalto University Learning Center project and was amazed by its spatial qualities. Thus, this description of the Hospital Club is based on the author’s personal experiences.

Located in Covent Garden, London, on the site of an 18th century hospital the Hospital Club is a private members’ club and creative arts venue. It houses a television studio, music studio, screening room, library, games room, meeting room, several restaurants, bars and lounges, and art gallery. Members of the Hospital Club include novelists,



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journalists, artists, producers, musicians and film makers (The Hospital Club). According to its Wikipedia page, “the Hospital Club’s main ethos is to encompass creativity through an environment that actively encourages its members to network and collaborate”. Notably, this is very similar to the goals of the Hub network. However the implementation of these ideas in the two cases varies.

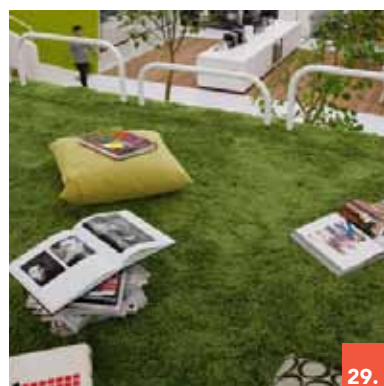
Visiting the Hospital Club is a truly sensual experience. From the cacophony of the street one suddenly steps into the serene atmosphere of the Hospital Club reception (see Figure 22 on page 33). This first aural impression is striking. The soundscape, quiet ambient music, is almost unnoticeable, but nevertheless affects one in a very profound, soothing way. Furthermore, the place is pierced with light creating a feeling that is nearly solemn. Dramatic relation between the light and the dark is supported throughout the space: one walks from a scantily lit corridor to a glaring bright terrace, from the warm light of a lounge room to the daylight of a restaurant. Sound follows the light varying from subdued to accentuated. Remarkably, the air in the space is appreciably fresh with a faint pleasant scent. It is later told that this was purposely designed, just as were the other elements subtly affecting the senses of the occupants. Tactile richness of textures in walls, floors and furniture only increases the stunning effect of a sensual feast.

The word that describes the space the best is “delightful”. The Hospital Club staff explains that creating an exceptionally pleasant environment is a conscious approach. They don’t only bring hundreds of creative professionals together and provide practical facilities, but create a setting that triggers positive feelings and supports creativity.

### TBWA/Hakuhodo Offices, Tokyo

Another example of using senses to build an efficient working environment is TBWA/Hakuhodo office space in Tokyo. It was designed by Klein Dytham Architecture in a large amusement complex in downtown Tokyo. The client – a joint venture of TBWA, a global advertising company, and Hakuhodo, Japan’s second-largest advertising agency – wished to “disrupt the agency’s clients’ expectations when they visit the space” and make it suggest that “the agency ‘thinks different’ even for themselves” (Klein Dytham Architecture).

The office occupies two floors with the main entrance located on the upper one. There one can find reception, gallery and meeting space for external visitors. A wide stairway with stepped seating descends onto the main level where it meets the “disruption court”, a common space that, as the designers describe it, runs through the office like a central park (see Figure 30 on page 35). This flexible area equipped with a large plasma





screen is used for presentations, collaborative events with clients and in-house social events. As the office is located in the old bowling alley, the floor plan follows its original logics. Accordingly, the desks are arranged in “bowling lanes” and circulation is organized between them. The most interesting feature of this office space is “a series of shelters for meeting rooms, project rooms and director’s offices [that creates] ...a small townscape in the space, where the raised areas on top of the shelters make for pleasant breakout spaces” (Klein Dytham Architecture).

Frankly speaking, Klein Dytham Architecture’s design does not create anything revolutionary in terms of the floor layout. Basically, it is a contemporary open plan office with various spaces for social interaction and allocated rooms that offer more privacy. However, the use of forms, colors, and materials creates the difference and takes it from ordinary to extraordinary.

The space has its advantages such as high ceilings and downsides such as lack of natural light. This unfavorable condition is addressed by integrated lighting that provides an even level of light throughout the space. However, it is impossible to tell how this affects the occupants without actual first-hand experience.

The materials used in the space mimic nature in a cartoonish way that is typical in Japanese culture. The shapes, too, largely follow the rules of “kawaii”

or cute. However, the modest use of color – warm greens, brown and white – return the design within the framework of an office environment. Admirably, the result surpasses all expectations and showcases a fun yet appropriate space that is likely to be seen as relaxed and welcoming. The playful shelters arising from the floor like moth-covered hills enrich the space with a remarkable dimension of different height levels. The fuzzy surfaces create interesting tactile experiences and improve personal connection with the space. Generally, the contrasts between soft and polished, fabric and glass, colored and white, enclosed and open help create the amiable atmosphere that promotes spontaneous interaction.

...

One should certainly learn from the above mentioned examples. Clearly, designing for senses is more common than it may seem. As can be seen, it is used to encourage creativity, ease interaction between occupants and underline exceptional nature of a project. Great attention to such spatial design aspects as color, light, and texture is vital in this approach. Materials should be chosen based not only on their technical, but also sensory characteristics.

Aalto University Learning Center, too, is initially planned as place that is “special”. Designing for senses may be a tool to take the future facility from ordinary to extraordinary.

## FINDINGS

Experts argue that 21st century learning must take place in contexts that “promote interaction and a sense of community [that] enable formal and informal learning” (Bass 2002 quoted in Partnership for 21st Century Skills 2009). Research shows that there are two approaches to designing these facilities. One is thoroughly defining a spatial program and operating within it. The other works through denying set program altogether to maximize flexibility when any space can be used for any activity. The latter one is claimed to be more capable of addressing the issue of change that lies at the heart of Aalto University Learning Center project.

However, expressing the concept of flexibility in form of a large open space with uniform characteristics did not prove rewarding. At the same time, there are clear indications that those environments strive that are planned in relation to human scale and employ user-centered approach to both design and operational methods. The most successful examples of such spaces feature careful work with human perception and senses.

Given these points, the following assumptions were made to be tested in the experimentation phase. First, user-centered design is the right approach to creating the learning center.

Second, combining different programs in one open space, while operating within human scale, is possible and beneficial.

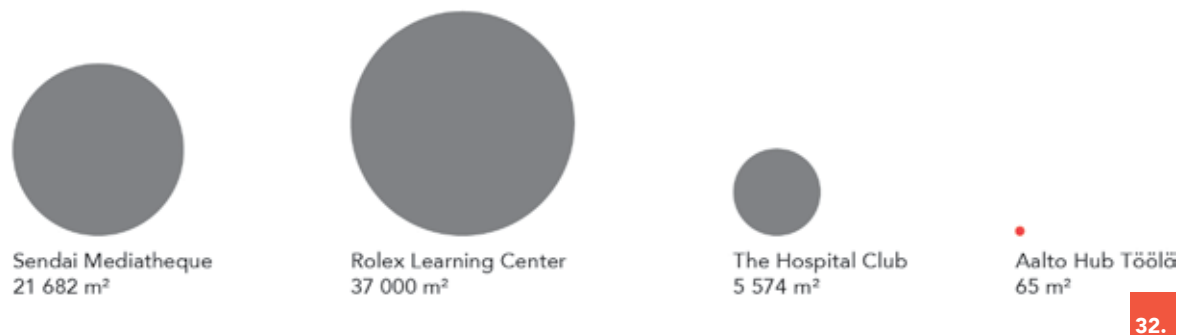
Third, continuous transformation of a space is possible to achieve through encouraging the occupants to modify the environment to fit their needs. Fourth, embedding human senses in spatial design strengthens the bond between the space and the occupant.

The author strongly felt that testing ideas was necessary to draw informed conclusions. If confirmed, these suppositions would form spatial design guidelines for Aalto University Learning Center.



# EXPERIMENTATION

Floor Area of Aalto Hub Töölö and Selected Reference Projects



The chance to experiment with Aalto University Learning Center concept presented itself in August 2011 when Aalto University Corporate Relations decided to test the ideas that originated from the Aalto University Learning Center discussion. The space for the prototype was offered by Aalto University Library at its Töölö campus facility in Mechelininkatu 3 D, Helsinki. The project was called Aalto Hub Töölö.

The development team consisted of four members from the original IDBM Learning Center student project group. Each team member had a specific assignment according to their background: Piia Näränen was responsible for communications and marketing; Jutta Leivonen took care of events coordination; Noel Lam Hau Yee was in charge of graphic design; and the author of this thesis Valeria Gryada designed the space and managed the project.

Aalto Hub Töölö project was done in two phases: start-up and maintenance. The first phase took approximately 1½ month and included creating a project plan, generating a marketing strategy, designing the space and building up. Aalto Hub Töölö was officially launched with a Grand Opening party on September 30, 2011 and ran until the end of December 2011 managed by the project team. Consequently the space remained at Aalto University Library, Töölö, as user-maintained. Attempts to relocate Aalto Hub prototype to Aalto University Otaniemi campus were underway as this thesis was being written.

It is important to note that the scale of the prototype was considerably smaller than that of the researched spaces. Naturally, that impacted the scope of work. Not every idea could be tested directly. Nevertheless, prototyping was a significant part of the design process.



## PLACE

Aalto University Library kindly suggested hosting the prototype space for Aalto University Learning Center, Aalto Hub, at its Töölö campus facility. As a matter of fact, this was the second location to be discussed in relation to testing the learning center idea. At first, Aalto University Library, Otaniemi, was believed to be more suitable platform due to its very favorable position in the very heart of Otaniemi campus, the largest part of Aalto University with about 250 professors and approximately 15,000 students (Wikipedia, Aalto University). That answered the first and foremost requirement for the learning center – a central location (Aalto Hub Magazine 2011). Unfortunately, due to restrictions associated with operating within the building designed by Alvar Aalto and protected as architectural heritage this initiative was discontinued.

Under those circumstances, the project team was delighted to start the project in the Töölö campus. The library staff, too, displayed a great deal of excitement about the project and granted the project team complete freedom of action. It was understood, however, that the location of Aalto University Library, Töölö, was far less advantageous. Situated on the edge of the Aalto University School of Economics campus, the library could hardly be described as lively. The majority

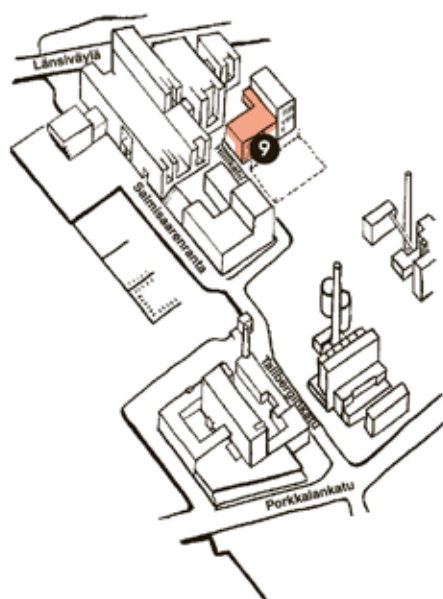
of people in the premises were the patrons coming for a quick visit to collect or return their loans or students in need of a quiet working facility. Private conversations additionally revealed that the library was not one of the most popular places on campus.

Position of the library was challenging, but the space offered for the prototype proved encouraging. The 65 m<sup>2</sup> room was situated on the second floor of the Aalto University Library, Töölö building to the right hand from the main staircase behind a glass partition wall. By all means this was a brilliant location. Everyone coming to the library to lend or return their loans would automatically pass by the space and be able to peek inside it.

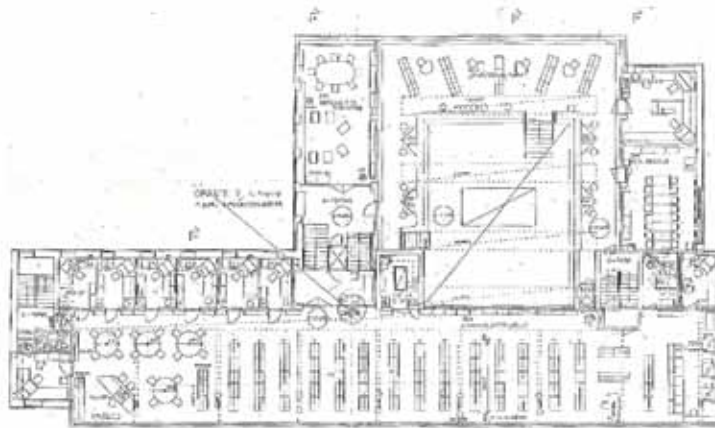
The room was originally used as an exhibition space equipped with furniture suitable for reading and writing. Although there was no strict rule regarding the sound levels, it was mostly silent individual work that was done there. Overall, the atmosphere in the space was stiff and unwelcoming. Yet, on the contrary to the library staff, the occupants seemed to be content with the space as it was and did not look forward to changes.

## Aalto University Töölö Campus

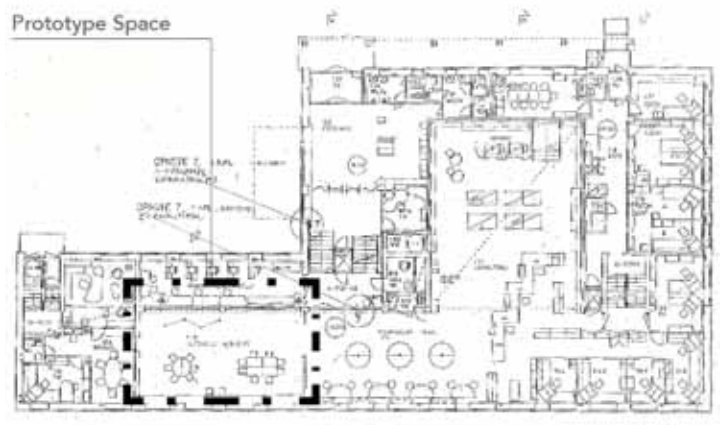
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Runeberginkatu 14-16
- 2 CHYDENIA  
Runeberginkatu 22-24
- 3 ARKADIA  
Arkadiankatu 24
- 4 ARKADIA 28  
Arkadiankatu 28
- 5 AALTO UNIVERSITY LIBRARY, TÖÖLÖ  
Meckelininkatu 3 D
- 6 ECONOMICUM  
Arkadiankatu 7
- 7 THE STUDENT UNION  
KY-HOUSE  
Pohjoinen Rautatiekatu 21 B
- 8 AUTOTALO  
Fredrikinkatu 48 A
- 9 TECHNOPSIS  
Hiilikatu 3



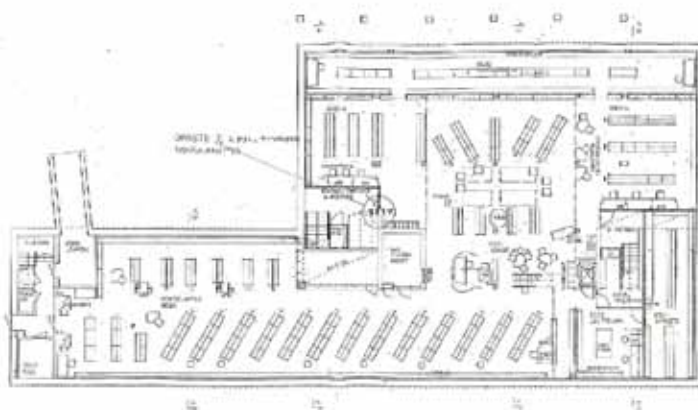
# Aalto University Library, Töölö



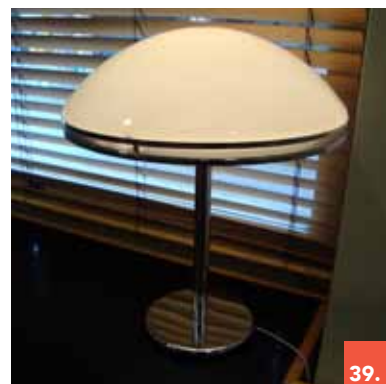
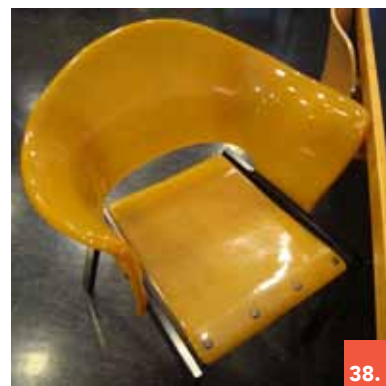
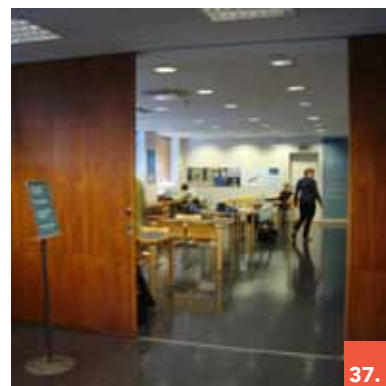
Second Floor



First Floor



Basement Floor  
Scale 1:500



## DESIGN

To begin with, Aalto University Corporate Relationships had a vision of the learning center prototype as a walk-in pavilion with posters. The project team suggested that it would not evoke enough interest and proposed creating an actual learning space and activities around it. Finally, it was agreed that the team would arrange both the pavilion and the learning space and organize activities in the space during the whole project period. With that in mind the work began.

The designing and build-up had to be done in 1½ month, a rather tight schedule. As the tasks were distributed among the project team members according to their background, the spatial design was done solely by the author of this thesis.

Using simple solutions became a general platform for all decision making as the project was only meant to run for three month. Therefore, it was decided to utilize the furniture that was already in the space whenever possible and only make the purchases that were absolutely essential.

### Layout

While the IDBM Aalto Hub project report suggested that the Learning Center should have separate zones for different activities from silent reading rooms to boisterous common areas, the author's own research spoke for

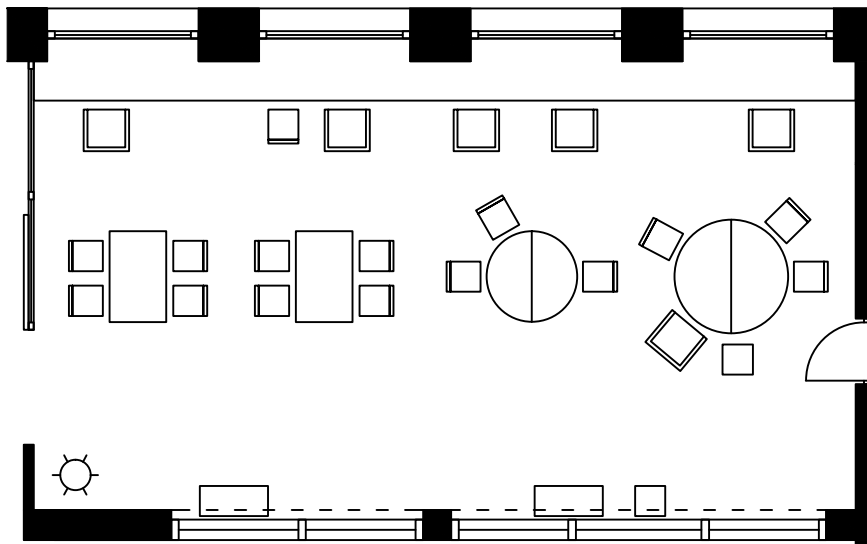
combining various functions within one space. As the prototype space was limited to only one room, it was natural to test the latter idea. Overall, the goal was to create a comfortable space that would promote spontaneous communication between the occupants.

It was noticed that the spatial conditions were quite uniform throughout the interior – an unfavorable condition according to the author's research. So the new design aimed to create areas that, while performing the same function, would cater to different occupants' states and needs from gathered to relaxed, from formal to informal.

New functions were to be added to learning/working that happened there already. Meeting spaces were introduced to the space along with a mini-kitchen that was equipped with a coffee machine and a water boiler. The idea was to create conditions that would enable the occupants to comfortably remain in the space for longer periods of time. As the main objective of the space was to promote interaction, it was decided to equip it with simple yet efficient feedback and communication tools that worked well in the researched spaces: a notice board, blackboard walls and erasable markers for writing on the glass partition.

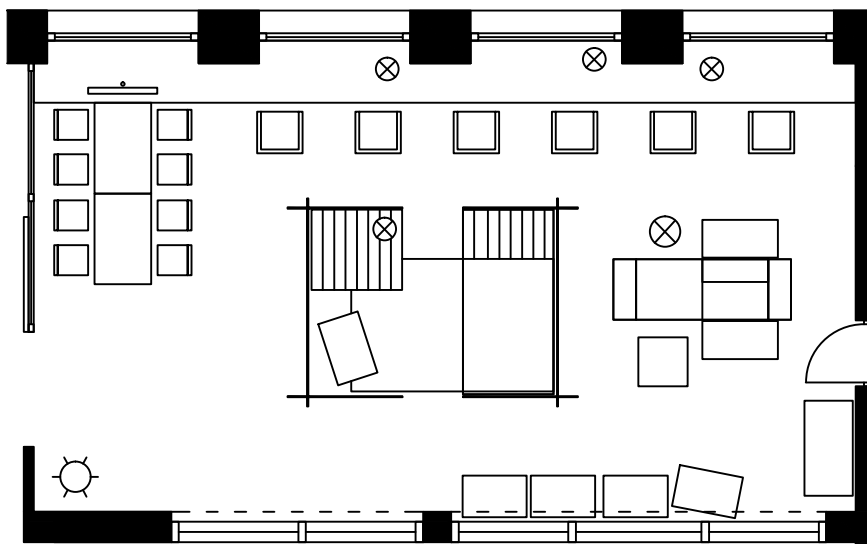
It was decided to change the wall color of the space to both create and manifest the spatial change. It is believed that color blue promotes

Floor Plan Before Prototyping



Scale 1:100

Aalto Hub Töölö Floor Plan



Scale 1:100



creativity (University of British Columbia 2009), so a shade of light blue complimented by yellow accents was chosen for the space. Quotations related to the new use of the space were placed on walls, and the floor space was used to invite people to the room and communicate rules such as removing shoes and permitted talking.

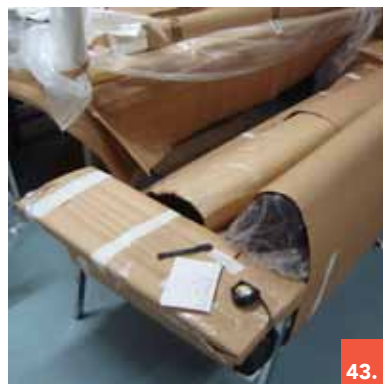
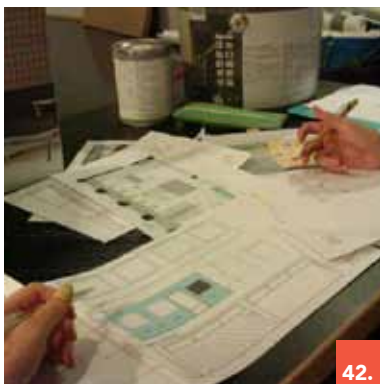
As new functions were to be added to the space, some additions to furniture were necessary to be made as well. The first idea was to bring in second-hand furniture to both cut the costs and give the space the desired “homey” look and feel. However, after going through several thrift stores and recycling centers it became clear that this “treasure hunting” approach was too time-consuming and did not guarantee the needed results in the given time. The second tactic that proved to be much more fruitful was using the student-designed furniture and objects. It was hoped that this solution would, first, strengthen the bond between the student-occupants and the space and, second, ensure constant change as new prototypes would be brought in to be tested.

The majority of furniture and textiles was found from Aalto University School of Arts, Design and Architecture storage rooms. The chosen items that beautifully suited the spatial design concept – a sofa with two stools, a coffee table, a lamp, a carpet and cushions –

were created for Habitare 2010 exhibition. Sadly, most of the further attempts to enable continuous transformation of the space failed. While the students from the School of Arts, Design and Architecture were invited to display their designs in the space, only two people contacted the author. It quickly became apparent that encouraging this form of spatial change would take remarkable curatorial efforts and, although extremely promising, require someone to work specifically on that task throughout the whole project.

It has to be mentioned that using student-designed furniture was a one-time solution as well. Unfortunately, the nature of these objects is such that one cannot hope for a uniform level of quality or supply that is guaranteed by the industry. Also, the spatial design approach in this case has to change from selecting furniture that fits the design to fitting the design to the furniture that is at hand – something acceptable in small projects but too complicated for the larger ones.

The only piece of furniture purchased for the space was the IKEA metal (and thus easily recyclable) counter-table for the mini-kitchen. Inspired by the same use at Ihana Kahvila café in Kalasatama, Helsinki, Sortit waste bags were obtained and filled with discarded plastic wrapping to create beanbag-like seating. However, multiple smaller items





such as tableware and stationary had to be bought to ensure that the occupants find everything they need within the space.

The space was refurbished by the project team themselves within several days.

## Hub House

The main wish of Aalto University Corporate Relations was to create a portable indoor walk-in pavilion that could be easily transported and re-assembled when Aalto University Learning Center initiative needed to be presented at an exhibition, a fair or another event. It was meant to become a discussion piece, something that would instantly catch attention. Originally the pavilion was planned to be relocated every month. However, it maintained in the space during the whole course of the prototyping project.

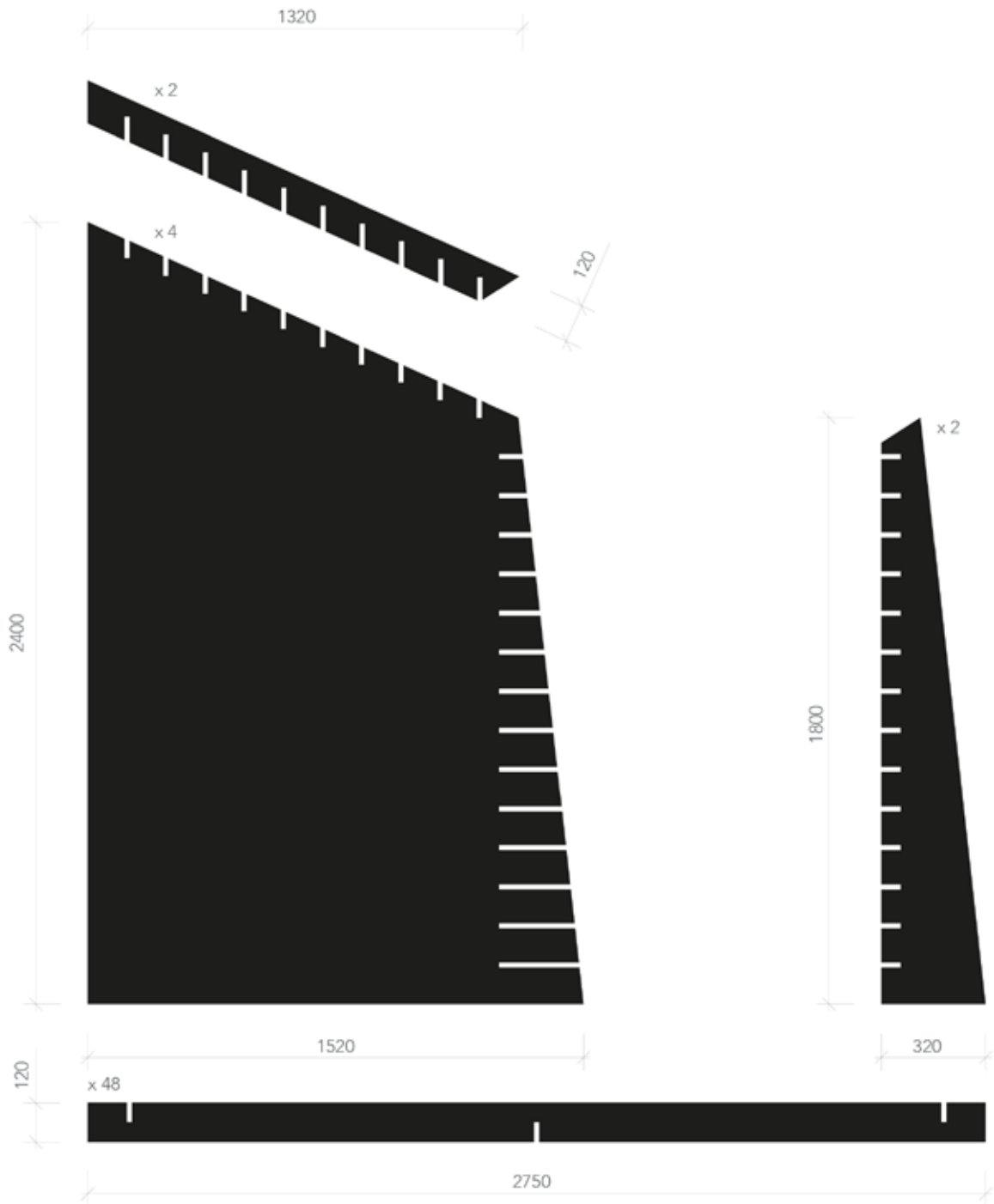
As the structure had to be simple, it was decided to use CNC-machine cut boards with “puzzle” joints. Different kinds of board were considered, including corrugated board, chipboard, MDF, plywood and OSB. Nevertheless, none of those were at the same time strong and lightweight enough. The solution came in form of Re-board, a rigid paperboard that combined light weight, strength and durability, could be digitally

printed or finished with decorative laminates. Last but not the least, it could be recycled as paper in normal waste paper streams.

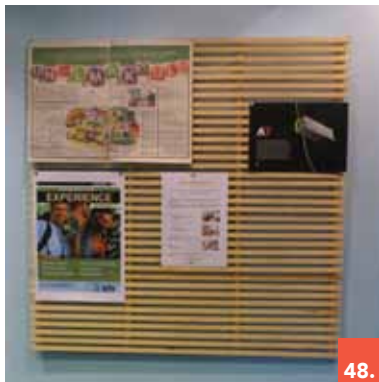
It was soon decided to shape the pavilion as a house to symbolize the building that the learning center would someday become. The first sketches pictured very house-like constructions with solid walls and roof. It had to be, yet, reconsidered as those solutions required great amounts of expensive material and did not provide a structure firm enough. The final design consisted of only four types of elements forming two identical “half-houses”. Those were to be placed opposite of each other with an eighty centimeter gap for entrance. This made assembling very easy and almost intuitive. Aalto Hub project description was printed on the outer side of pavilion walls.

In the interior the pavilion provided a “space inside a space”, creating a comfortable lounge area and separating other functions. It was equipped with two platforms for sitting, a large carpet, cushions, throw blankets and a lamp. Later in the dark season a bright light lamp was brought inside the pavilion on the occupants’ request.

Aalto Hub Pavilion "Hub House". Elements



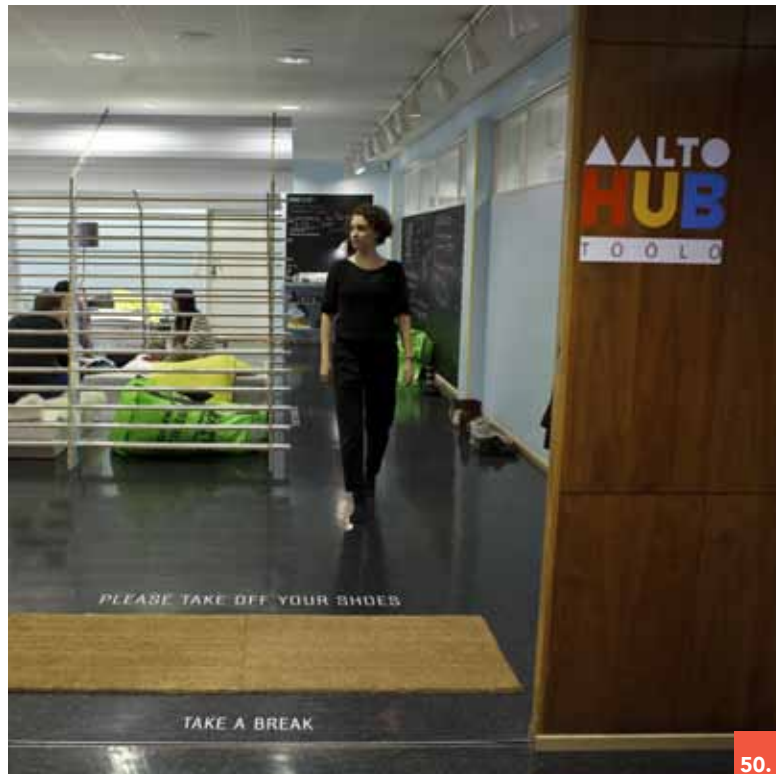
Scale 1:20



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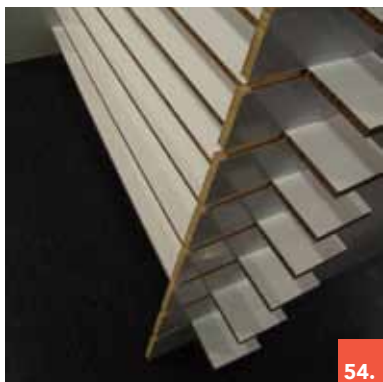
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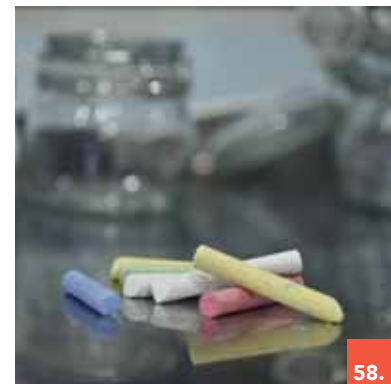
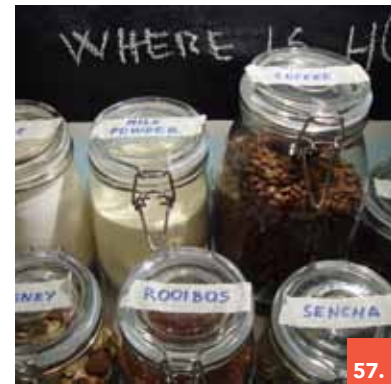
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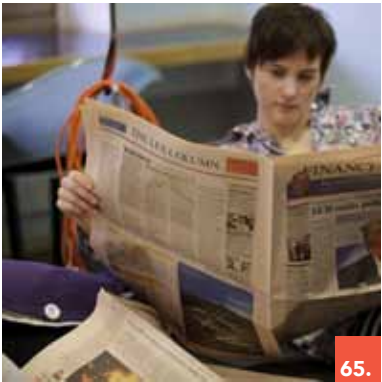
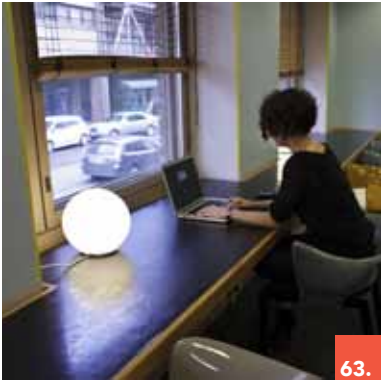


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## RECEPTION

Aalto Hub Töölö was launched with a Grand Opening party on September 30, 2011. The space received very favorable reviews from the guests, so the team expected the library occupants to be pleased with the new space as well. However, the responses were mixed. While the “outsiders” expressed excitement about the changes, those library patrons who used to work in this part of the building were reluctant to accept the learning center prototype.

Simply put, the main idea behind the project was to get people to talk to each other; and that proved to be quite a challenge. The atmosphere in the space was very rigid to start with. The room was mostly used by students who were writing their final works and required complete silence. They argued a lack of suitable facilities elsewhere on campus. In fact, a quick observation of the library premises alone showed irrelevance of those claims as there was plenty of quiet working space on all floors. Yet, while every other space was rather densely “populated”, this particular room had a very high square meter per person ratio. Remarkably, the 65 m<sup>2</sup> space was normally used by less than ten people at a time, one person often occupying a table that could fit at least four. However, it was not only the inefficient floor plan that was an issue. The real problem lay in a “social rule” of imposed silence that effectively forced “unwelcome” people out of the room.

The same behavior continued in the re-designed space. In spite of embracing the change, the “old” users – a small but powerful group of people – bonded against the Aalto Hub Töölö concept and organizers. This was when the author realized that a keystone aspect – user participation – got overlooked in the hurried design process. Being students themselves, the project team assumed that they represent the users. That, however, was false. Chances are, this confrontation could have been avoided should the occupants of the space been involved in the planning. Gradually the conflict straighten itself out as many new users without previous knowledge about the “silence rule” came to the space and the old users either accepted the change or left. Remarkably, this issue gave a “proof from the contrary” and confirmed that user-centered design was the right approach to designing such spaces.

This clash between the old and the new also illustrates that existing spatial program cannot be modified thoughtlessly. As a matter of fact, the project team practically disregarded background research about the space. On the one hand, that is understandable. There was no alternative to the offered venue; the prototyped functions were clearly defined; the team was assured that the place was suitable for testing those; and the project schedule was very demanding. On the other hand, it would have been beneficial to study the library premises to fully understand the spatial relations between the whole building and

the prototype space. This research was, however, only done postfactum.

## Space

The layout of the space proved to be generally efficient. Locating the mini-kitchen at the far end of the space ensured that people walked through the entire room and got acquainted to it even if originally their only intent was to get a drink. The mini-kitchen very soon became extremely popular among the library patrons bringing dozens of people to the space every day. Lounge zone with the sofa was occupied most of the time either by individuals or groups of people. Several times this area was used for workshops. Working zone with six seats by the windows was utilized most of the time, and additional chairs were brought there by the occupants during busier periods. Meeting zone, on the contrary, was seldom used as intended. After a while it was reorganized to provide more working space, as it was in most demand.

The Hub House quickly became the favorite spot of the Aalto Hub Töölö visitors. Notably, it managed to work as the intended “discussion piece” to some extent instantly grabbing attention with its appearance. Occupied most of the time, it was used as a meeting room, lounge, reading room and even a place for a nap. For the author this confirmed the assumption that people positively respond to smaller scale closed spaces

inserted into larger open ones as seen, for example, in TBWA/Hakuhodo offices.

While reluctant to re-arrange the furniture in the rest of the space, inside the Hub House the users were very eager to do it and came up with numerous ways of forming comfortable seats out of provided items. This activity, while much-welcomed, posed a real threat to the structure of the Hub House as the walls of this temporary exhibition piece were not meant to be constantly leaned against. With time the joints loosened and, while there was no actual danger of collapse, the Hub House started to unpleasantly slant. The author soon realized that action had to be taken to prevent greater damage as the users persisted in their behavior and failed to “get educated” on the matter. The answer to the problem was rotating the floor platforms 90 degrees and turning them into backrests that due to their large weight simultaneously acted as reliable wall supporters. In addition, hand-written signs “Lean on me, not on the house wall” were posted to the platforms by activists among the users. Though, more thinking needed to be done on alternative ways to permanently address this issue as the Hub House was still to be used for its originally intended purpose as an exhibition pavilion after the completion of the project.

Although the described solution could hardly be called elegant from a designer point of view, it was warmly welcomed by the occupants of the



space, who liked the “hands-on” approach. Interestingly, the more “un-designed” and messy the place became with tear and wear the more active were the people in its further customization. This, in the author’s opinion, shows that overdesigning may equally inhibit the sense of ownership of the place and its creative potential as neglecting the design altogether. A certain level of “creative mess” must be maintained together with providing the tools for customizing the space.

## Activities

Various happenings were arranged at Aalto Hub Töölö to bring more people in. Most events in the space were organized by the project team. Some of them – the Grand Opening with approximately 50 guests and the invitation-based Social Innovation Speed Dating with roughly 25 attendees – required closing the space for other visitors. Four “Jäänmurtajat” people skills training sessions, on the contrary, were held with the doors open so that outsiders could join the events as well. Little Christmas party was arranged the same way; and the user feedback workshop took place without interrupting the normal life of the space. All those happenings were successful as the project team had the authority to “make noise” and reorganize the space when necessary.

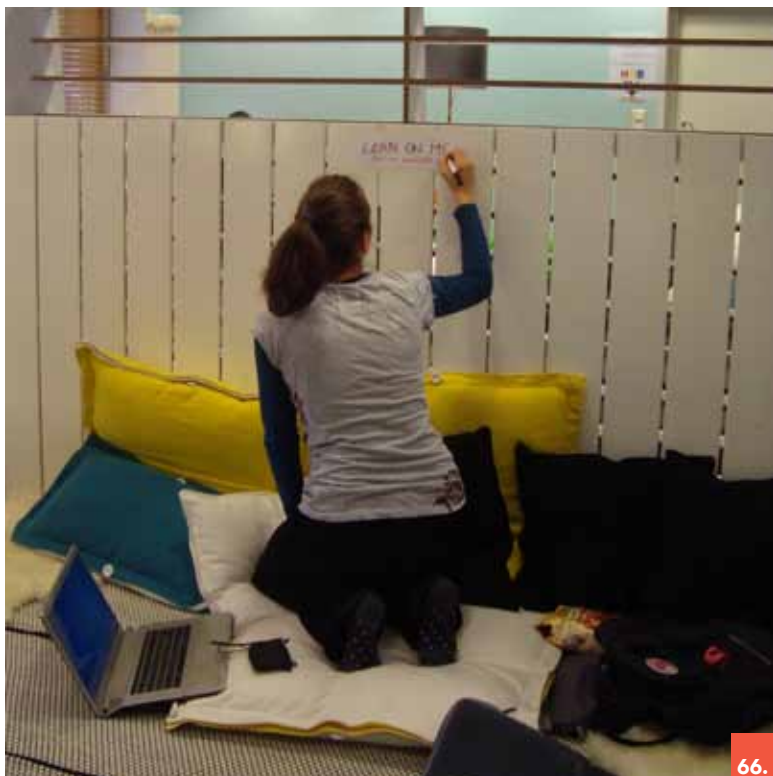
However, no event was arranged by the users. Even having group meetings in the space proved

to be challenging as different users had conflicting requirements regarding noise levels confirming that “soundscapes are an arena for a power struggle among those that share the space” (Blessner and Salter 2009:7). While talking in low voice and the sound of the coffee machine were accepted by the most, heated discussions and laughter were clearly unwelcome. Sadly, quiet working remained the main use of the space. In the author’s opinion it was related to perception of the library itself as an official institution and behavioral patterns connected to it.

On the bright side, at least one reassuring activity emerged without any influence from the project team. “Wednesday Cupcakes” were weekly served by a volunteer among the library patrons who wished to test her confectionery business idea. This well illustrates that people can be very proactive if the environment is supportive of such behavior.

## Feedback

“Our Better Hub” workshop was organized in the closing stages of the project to find out how the users felt about the space. During a two hour session four people from the Aalto Hub Töölö “regulars” shared their opinions and gave suggestions to the project team. The goal was to jointly find opportunities for improvement rather than only pinpoint weak spots.



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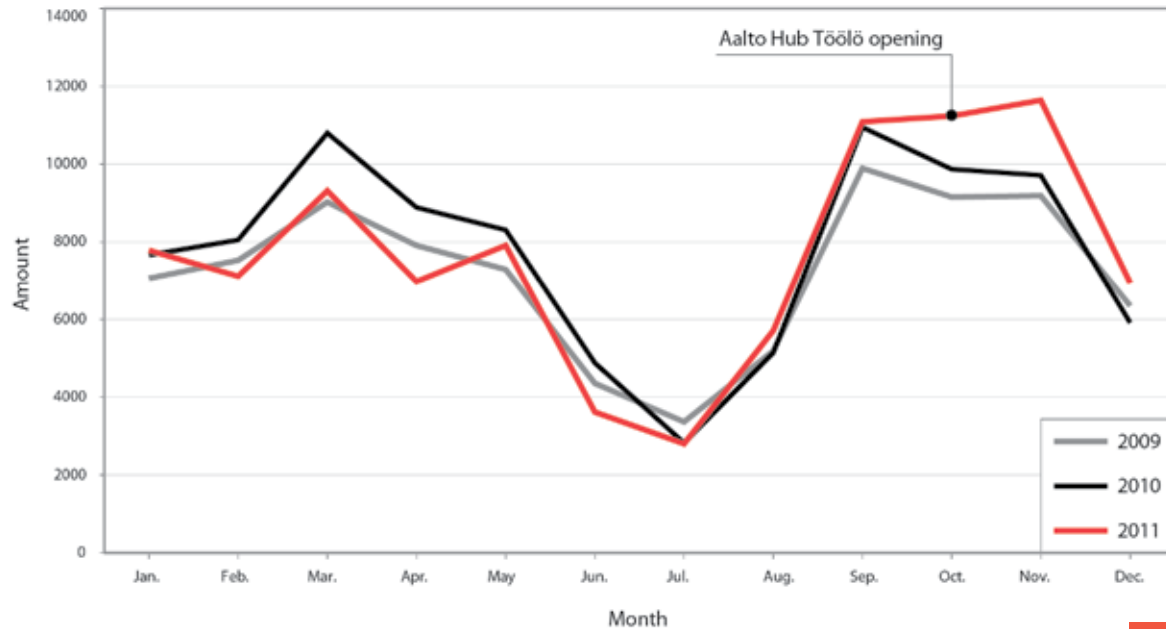


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## Visitors 2009-2011 Aalto University Library, Töölö



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Overall the place was described as comfortable and pleasant. The respondents liked its casual atmosphere and colorful design. In fact, the idea of color was brought up several times and considered very important. Spaces with little color were described as cold and unwelcoming.

The Hub House was named as the favorite spot as it created a sense of privacy in a very public library space.

Besides, the users expressed wishes for a more relaxed space where their behavior would be unrestricted. They also mentioned that the space could be less “finished” leaving some room for modification. They wished for tools that would allow them to reorganize the space according to their changing needs. Additionally were expressed wishes for more art in the space. Manifesting cultural diversity was important to the workshop

participants as well. It was proposed to do it through periodically re-decorating the space by the users in accordance to their cultural background.

Surprisingly, the workshop participants volunteered to take care of the space as “Hubstars”. The idea behind it was to create a bond between the users and the space and foster the sense of ownership. Apparently, this tactic worked as the Hubstars were often referring to Aalto Hub Töölö as “their” space.

The impact of the project can also be seen in figures. The statistics of Aalto University Library, Töölö, has shown increase in number of visitors by 12.2% in October when the prototype space was launched, by 16.6% in November and 14.8% in December 2011 compared to the same period previous year.

## FINDINGS

Prototyping was extremely valuable in the process of defining spatial design guidelines for Aalto University Learning Center. Although operating on a much smaller scale than the reference projects, it helped the author better comprehend the concepts discussed in the previous chapter. The scale difference also contributed to understanding that the proposed design guidelines should work equally well for spaces of all sizes.

Initially the prototype space was seen as separate from its host, the library. The design had little consideration for the relationship between the two. However, during the prototype analysis it became apparent that it was a mistake. The building had to be understood as a single environment and thoroughly studied before introducing the new space. Additionally, as the data collection focused on the prototyped space only, little knowledge was acquired of how the prototype affected the building other than the library statistics.

Combining different programs in the prototype proved to be challenging. However, that was most likely connected to relatively small size and uniform characteristics of the room. In the author's opinion, that does not directly contradict the assumption that joining different functions in one space is possible and beneficial. Rather, it stresses the importance of "spatial diversity" when a

different spatial conditions are created throughout the place and used to support different functions.

Another important observation was that failing to involve the users in design process can have such negative consequences as alienation from the space. Thus, encouraging user participation both during designing and running the learning center should be mandatory. Additionally, tools for easy customization of the space should be provided to ensure continuous change in the premises. Better occupant involvement can be achieved through "creative mess", a consciously under-designed space that promotes modification.

Sadly, embedding human senses in spatial design practically failed to be tested due to limitations imposed by the library. Under constant pressure of "getting in the way" the author had to compromise on introducing soundscape and changing lighting conditions in the space. Although the occupants welcomed bright colors and soft textiles, this reaction is too obvious to make any conclusions. However, the author still believes that working with human senses has significant potential for improving spatial qualities.

Overall, while not always successful, prototyping provided some valuable insights into the way learning spaces function. It was also important to take research to a more practical level and work directly with the future users of Aalto University Learning Center.



# REFLECTION

## EVER-CHANGING SPACE

The starting point for this thesis was a vision of an ideal learning environment – a space that always meets the needs of its occupants and embraces constant transformation as an essential part of its nature. Through research and experimentation the author came to conclusion that this vision could be transformed into a set of practical recommendations. A set of guidelines called “Ever-changing Space” was created to be used both when designing the Aalto University Learning Center and updating the existing facilities of the University.

“Ever-changing Space” describes spatial qualities that will support learning process as it happens now. Following these recommendations will also allow a smooth transition into the future, the change deriving from the grass-roots level. The concept is built around user experience and can be applied to spaces of all sizes and purposes.

“Ever-changing Space” concept deals with four phenomena: physical environment, perception, change, and control.

### Environment

It is believed that the physical aspects of a learning environment can have a direct influence on learning, behavior, and productivity (Kopec 2006:189). The author’s research suggests that

probably the most important quality of a good learning environment is spatial openness, both actual and perceived. The space should be, look and feel easily approachable. That can be achieved through introducing a generally open floor plan, reducing the number of walls and replacing them with glass partitions, and using furniture to zone space and guide its function. The main principle here is transparency: all functions of the space should be observed without obstruction. On the mental level this will communicate such values of Aalto University as Openness and Equality (Aalto University Strategy 2011).

However, openness should not be translated into a vast empty space with uniform characteristics. On the contrary, the environment should allow flexibility and offer a mix of open, semi-open and closed spaces in different sizes. That will support educational process as different learning activities require different spatial arrangements.

Maximum spatial variety should be created to guarantee rich spatial experiences and offer new opportunities for unexpected and unplanned use. It has been proven that spatial qualities have a direct impact on human understanding of a place. For instance, brighter spaces with higher ceilings are perceived as more public, while darker spaces with lower ceilings are felt to be more private (Augustin 2009:228). Thus, a function of a space can be

naturally guided through its architectural characteristics. In his book “Architecture: Form, Space, and Order” Francis D. K. Ching lists the key visual properties of architectural space. They are proportion, scale, form, definition, color, texture, pattern, enclosure, light, and view. He adds that there are four types of spatial relationship: space within a space, interlocking spaces, adjacent spaces, and spaces linked by a common space (Ching 1979). All that should be considered when designing the learning center environment.

Architecture functions on many scales. However, in this case it is essential to maintain on the human scale. That should warrant that the occupants are not dominated by the environment. Likewise, high-end design should be avoided as it was found to be intimidating in the context of a learning environment. The choice of finishing and equipment should support relaxed, welcoming and even playful atmosphere.

## Perception

Designing for senses should be embedded into the project to create a comfortable and stimulating environment. This can be done by shifting from function-oriented (what a person does in a space) to feeling-oriented (how a person feels in a space) design approach.

Hearing, sight, touch, and smell should all be considered during design process.

The basic human needs for good lighting conditions, comfortable temperature and good air quality are already covered by construction legislation. Yet, it is beneficial to go beyond these minimum recommendations and create a situation that is tailored specifically for the process that happens in a space. For example, it has been shown that the temperature of 22 degrees Celsius is optimum for learning, and its fluctuations to both directions negatively affect mental efficiency of the occupants. Also, better concentration levels are achieved in rooms with better quality and greater quantity of lighting (Kopeck 2006:194). As for the air, in classrooms it should circulate 1.5 times per hour (Augustin 2009:223). By all means, these essentials will lay a platform for a good learning environment. Furthermore, as Aalto University Learning Center will be composed of spaces serving very different functions from library services to exhibitions, to eating and drinking, it is crucial to address all those with appropriate conditions.

Color is an important factor in visual perception of space. Different colors have very profound effects on human brain. They can, for instance, have energizing or relaxing effect. Learning abilities are affected by colors as well: lighter, less saturated greens are reported to



create the appropriate frame of mind to learn; red inhibits learning ability and even blocks the use of already learned information (Augustin 2009:222). Most remarkably, white and off-white decrease human efficiency by an average of 25 percent (Kopec 2006:192). Therefore, it is recommended to use various colors suitable for the purposes of a space in the design of the learning center.

Sound is another element of an environment to be taken into account. First of all must be considered the issue of noise – unwanted, uncontrollable and unpredictable sound that may be produced both by exterior sources such as traffic or construction and vocal tones. It is believed that ambient noise can negatively impact psychological health and wellbeing (Kopec 2006:108). Consequently, diminishing noise is a key design task. Different soundscapes can then be carefully introduced to the space in addition to mild sounds of speech and laughter that enliven the environment.

The choice of materials is emphasized as their qualities, visual and tactile, largely define the way a space is experienced. Their olfactory qualities must not be ignored either. Some materials present a good combination of these three aspects. For instance, many people agree that wood looks appealing, has a rich texture and a pleasant smell that reminds them of

experiences they've had like spending time by a fireplace at a country house or camping. Generally, materials with more pronounced character that trigger positive emotions should be given preference.

It is well known that views of nature improve satisfaction and wellbeing. Additionally, green spaces have an ability to promote social relationships as people are naturally drawn to them (Kopec 2006:138-139). Thus, it is recommended to understand nature as an integral part of the learning center design. The more traditional solutions to this are parks and indoor plants. Also, establishing a community garden is recommended given the growing importance of urban agriculture (Smit, Nasr, and Ratta 2001) to both improve the quality of the environment and invigorate the community.

Overall, involving all senses is necessary to achieve fuller engagement of the people in the space. Equally important, the way the environment is experienced should be constantly monitored to highlight best practices and make adjustments to design solutions that are less successful. This will make Aalto University Learning Center more adaptive to the needs of its occupants and change in general.



## Change

Natural spatial transformation within time is a key element ensuring that the space of the learning center always meets the changing needs of its occupants. Markedly, this should be a bottom-up process initiated by the people in the space. In the author's opinion, it can be achieved through encouraging pro-active user participation in everyday life and design of the space. Hopefully, a fostered sense of community and ownership will be a positive side-effect of these actions.

As discussed above, the function of space should be largely guided by furniture. This is especially important as, according to this concept, spatial program of Aalto University Learning Center will not be strictly defined. Then, by re-organizing the equipment the occupant will also re-form the entire place. It is suggested to provide the occupants with tools for quick and independent modification of the environment. The examples of such tools are movable walls and transportable furniture solutions. Importantly, in addition to unquestionable functionality, these items should be designed to also appear easy to handle.

However, certain conditions should be created to encourage users to modify floor plan according to their changing needs. This

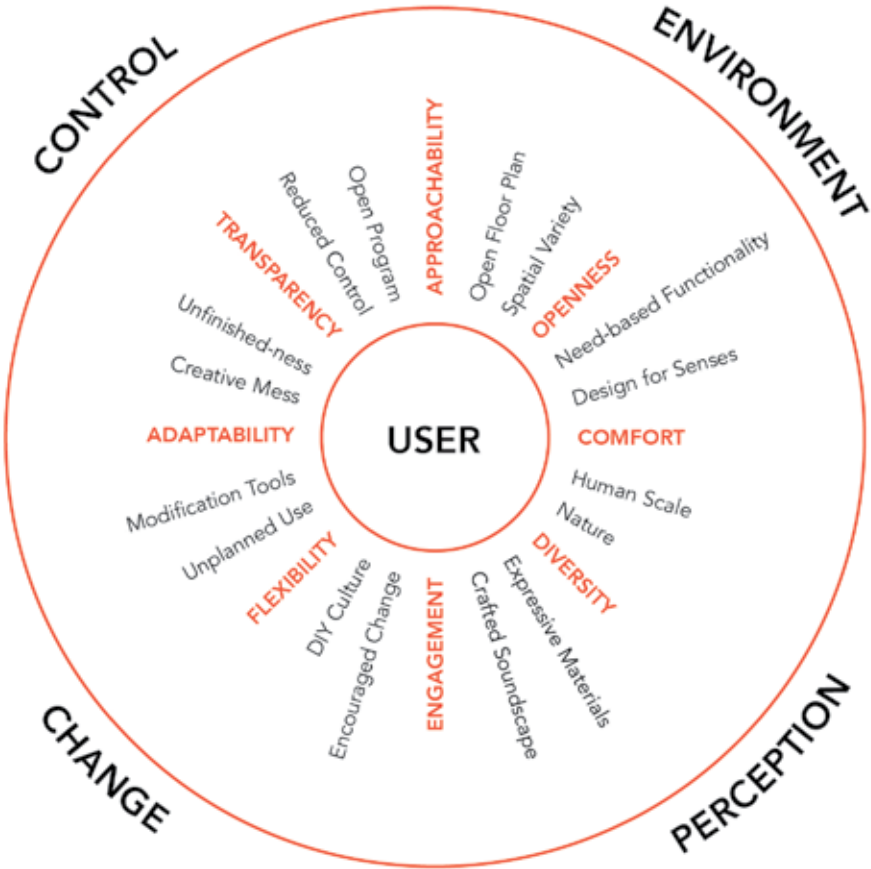
behavior should be supported by institutional culture that promotes constant reorganization and a "Do It Yourself" approach. The occupants must feel free to carry out the changes as they see fit. That brings up the issue of control.

## Control

Educational facilities traditionally maintain a high level of control over their premises. That is, of course, generally guided by safety concerns. At the same time, there often is a tendency to retain excessive orderliness to the detriment of freedom and creativity. While the balance between order and disorder is undoubtedly necessary, in case of the learning center preference should be given to the latter. Freedom to use the space must be regarded as of paramount importance to allow change to happen.

Yet, control issues do not only apply to the University. Professionally planning the future, designers are prone to this problem as well. Spatial designers in particular plan the way occupants will interact with their environments. In reality, it often happens that spaces are "misused": the furniture is misplaced, the rooms are cluttered, and new functions replace the designed ones. However, this "misbehavior" is, in fact, a positive thing. It means that the space is "alive", and the

Ever-changing Space Concept Diagram



occupants perceive it as their own, enough to feel empowered to re-shape it.

Hence, these guidelines call for reduced control over the space of the learning center. They suggest that a certain level of disorder, or “creative mess”, must be accepted as a part of design and even encouraged to ensure that the space “lives” and allows transformation. Also, the author’s research has shown that the spaces that appear too refined inhibit change. So it is advised to create designs that communicate “unfinished-ness” and welcome the users to complete them.

### Spatial Design Guidelines

To summarize, “Ever-changing Space” design guidelines operate within four phenomena: physical environment, human perception, change, and control.

The guidelines provide a set of qualities that will allow Aalto University Learning Center to constantly undergo a process of natural change in response to the shifting needs of its occupants. These qualities are approachability, openness, comfort, diversity, engagement, flexibility, adaptability, and transparency.

Key practical recommendations include the following:

1. Maintaining an open spatial program that is physically expressed through an open floor plan.
2. Creating maximal spatial variety within the environment.
3. Allowing the use of the space to be defined by its architectural characteristics and needs of the occupants.
4. Sustaining human scale.
5. Engaging senses through use of expressive materials with high visual, aural, tactile and olfactory qualities
6. Using color and sound as methods to positively influence mental state of the occupants.
7. Embedding nature into the space.
8. Reducing control and supporting unexpected use of the environment and a DIY culture.
9. Offering occupants tools for quick independent modification of the space.
10. Allowing a certain degree of disorder and unfinished-ness in design.

## CONCEPT APPLICATION

Experts argue that environment of learning facilities communicates the value of education (Augustin 2009:221), so spatial design of the learning center is directly linked to occupants' appreciation of the learning process.

“Ever-changing Space” guidelines are mainly intended as a tool to assist spatial design process of Aalto University Learning Center. However, they can also be used when updating the existing facilities of the University. As intended, the presented guidelines maintain on generic level and can be applied to any possible location and size of facility. While not providing any final solution, the framework sets direction for the future planning activities.

The author hopes that these guidelines will be consulted when designing the learning center or similar spaces. Given that plans were made to arrange at least one space similar to Aalto Hub Töölö in Aalto University Otaniemi campus, this seems to be a realistic prospect. Ideally, these guidelines will be available to everyone at Aalto University responsible for spatial planning.



# CONCLUSION

The process of writing this thesis was both exciting and challenging. Fortunately, the chosen method – observation, experimentation and reflection – was appropriate for this project and required no alteration.

Obviously, observation, or theoretical research, was necessary to deeper understand the topic. Also, personal visits to some of the studies spaces were indeed helpful in forming opinion about design of a good learning space. However, these ideas would be inadequate without experimentation. Testing assumptions was vital for the result of this work as some of them, in fact, were proven wrong. Prototyping allowed combining theoretical knowledge and practice and gave plenty of valuable material for reflection. The formed guidelines, while corresponding to the findings from the theoretical part of this thesis, are largely based on the feedback from the trial space.

Creating Aalto Hub Töölö became an amazing experience of working on a project with non-designers. The author is grateful for the amount of trust and support she received from the team who never questioned her expertise or decisions, and offered plenty of valuable advice. It was also empowering to see how much excitement about this initiative was shown by both Aalto University and people outside the project.

Of course, some difficulties were faced while doing this work. Most significantly, it was hard to apply theoretical knowledge to the test space and relate the data gathered during prototyping back to theory. That was generally connected with major scale difference between Aalto Hub Töölö and reference projects. The author also regrets compromising on researching the impact of senses in the prototype space. Sadly, this opportunity was missed. Yet, the biggest challenge in this project was the conflict of designer's ego and the will of the space occupants. This was an important educational aspect, too, as it taught the author to see users as equals during design process.

A great deal was learnt from this project both in terms of facts and design practice. The “Ever-changing Space” guidelines well reflect the author's beliefs. Nevertheless, it could be fruitful to further investigate possible application of the concept. Practical cases would be of much interest regarding this matter. By and large, the author is satisfied with this thesis and hopes that it will be found useful by the Aalto University community.





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